REMARKS

Claims 1-57 are currently pending. No claims have been amended.

Rejection of the Claims Under 35 U.S.C. §103(a)

Reconsideration is requested of the rejection of claims 1-57 under 35 U.S.C. §103(a) as being unpatentable over Hale, et al. (U.S. Patent App. Publ. No. 2003/0039851) in view of Chung, et al. (EP 1 106 640), and further in view of Strand, et al. (U.S. Patent App. Publ. No. 2004/0127609).

Claim 1 is directed to an absorbent article comprising a laminated outer cover, the laminated outer cover comprising a biodegradable stretched aliphatic-aromatic copolyester film. The film comprises filler particles and a copolyester comprising from about 10 mole% to about 30 mole% of aromatic dicarboxylic acid or ester thereof, from about 20 mole% to about 40 mole% of aliphatic dicarboxylic acid or ester thereof, from about 30 mole% to about 60 mole% dihydric alcohol, and wherein the weight average molecular weight of the copolyester is from about 90,000 to about 160,000 Daltons, and wherein the number average molecular weight of the copolyester is from about 35,000 to about 70,000 Daltons, and wherein the glass transition temperature of the copolyester is less than about 0°C.

Hale, et al. is directed to multilayer films comprising a layer of a thermoplastic polymer such as an aliphatic-aromatic copolyester (AAPE). The AAPEs may be comprised of diols and diacids. In one preferred embodiment, the AAPE comprises about

30 to about 75 mole % of adipic acid, about 25 to about 70 mole % terephthalic acid, about 90 to 100 mole % 1,4-butanediol, and 0 to about 10 mole % of modifying diol, based on 100 mole percent of a diacid component and 100 mole percent of a diol component. The AAPE may optionally comprise from about 0.01 to about 10 wt.% of a branching agent, and from 0 to about 80 percent by weight of a filler. The multilayer film in stretched form has a moisture vapor transmission rate of at least 300 g-µm/m^2-hour (or g-mil/m^2-day), and preferably greater than about 500 to about 10,000 g-µm/m^2-hour. The AAPE may be formulated into multilayer films and incorporated into articles such as diapers.

Significantly, Hale, et al. do not disclose a copolyester having applicants' claimed amounts of aromatic dicarboxylic acid, aliphatic dicarboxylic acid, and dihydric alcohol, <u>and</u> that has a weight average molecular weight of from about 90,000 to about 160,000 Daltons, a number average molecular weight of from about 35,000 to about 70,000 Daltons, and a glass transition temperature of less than about 0°C.

Chung, et al. is directed to a copolyester resin composition comprising 0.1 wt% to 30 wt% of an aromatic-aliphatic prepolyer having a number average molecular weight of from 300 to 30,000, 40 wt% to 71 wt% of one or more aliphatic or alicyclic dicarboxylic acids or anhydrides, and 29 wt% to 60 wt% of one or more aliphatic or alicyclic glycols. The copolyester resin has a number average molecular weight of from 30,000 to 70,000, a weight average molecular weight of from 100,000 to 600,000, a melting point of from 55°C to 120°C, and melt index (at 190°C, 2,160g) of from 0.1 to 30 g/10 min. The copolyester

product is biodegradable and may be used for packaging film and rubbish bags.

Strand, et al. is directed to a flame retardant polyester composition suitable for calendering. The composition comprises a polyester having a crystallization half time from a molten state of at least 5 minutes wherein the polyester is a random copolymer, a plasticizer, a phosphorus-containing flame retardant miscible with the polyester plasticized with the plasticizer, and an additive effective to prevent sticking of the polyester to calendering rolls. The polyester may comprise at least 80 mole percent of diacid residues comprising one or more of terephthalic acid, naphthalenedicarboxylic acid, 1,4-cyclohesanedicarboxylic acid, or isophthalic acid; and diol residues comprising about 10 to about 100 mole% 1,4-cyclohexanedimethanol and 1 to about 90 mole % of one or more diols containing 2 to about 20 carbon atoms, wherein the diacid residues are based on 100 mole % and the diol residues are based on 100 mole %. The polyester may further comprise from 0 to about 20 mole percent of one or more modifying diacids, including aliphatic dicarboxylic acids and aromatic dicarboxylic acids. The polyester composition has a glass transition temperature ranging from about -45°C to about 40°C.

As stated in MPEP §2143, in order for the Office to show a prima facie case of obviousness, the Office must meet three criteria: (1) the prior art reference(s) must teach or suggest all of the claim limitations; (2) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the

art, to modify the references or to combine reference teachings; and (3) there must be some reasonable expectation of success. In the instant case, there is no suggestion or motivation to modify or combine the cited references to arrive at claim 1.

As noted above, the Hale, et al. reference fails to disclose the number average molecular weight or weight average molecular weight of the AAPEs disclosed therein. Recognizing this deficiency, the Office has cited Chung, et al. for combination with Hale, et al. More particularly, the Office has stated that Chung, et al. teach a substantially identical copolyester film as disclosed in Hale, et al., and therefore the number average and weight average molecular weights disclosed in Chung, et al. would be inherent properties of the film of Hale, et al. Applicants respectfully disagree.

A finding of inherency cannot be based on *mere assumptions* by the Office. Rather, to establish inherency, "the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic <u>necessarily</u> flows from the teachings of the applied prior art."[1] Furthermore, "[t]he fact that a certain result or characteristic <u>may</u> occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic."[2]

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[1] MPEP §2112 (citing *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

[2] MPEP §2112 (citing *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993)). MPEP §2112 also states "[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." (quoting *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

In the instant case, the Office is assuming that the AAPEs of Hale, et al. will have the same weight average and number average molecular weights as the films of Chung, et al., simply because the films of Hale, et al. and Chung, et al. may comprise similar components. However, this assumption is incorrect, as a close reading of the Chung, et al. and Hale, et al. references indicates.

Initially, applicants note that the Office has stated that Chung, et al. teach a substantially identical copolyester film with identical breakdown by mole% to the film taught by Hale, et al. Applicants respectfully submit that this is not accurate. Chung, et al. do not disclose specific mole % for the components of their copolyester resins. In fact, the only mention in Chung, et al. of molar quantities of components is given in ¶23 of Chung, et al., which is describing preparation of the aromatic-aliphatic <u>prepolymers</u>, which are but one component of the copolyester resin of Chung, et al. To produce the aromatic-aliphatic prepolymers, one or more aromatic dicarboxylic acids, one or more aliphatic dicarboxylic acids, and one or more aliphatic glycols are reacted. In ¶23, Chung, et al. state that in the first reaction step (i.e., preparation of the prepolymers), for 1.0 mole of total dicarboxylic acid (i.e., sum of aromatic and aliphatic dicarboxylic acids), the mole ratio of aliphatic or alicyclic glycols is preferably from 1.1 mole to 1.5 mole, and that for dicarboxylic acid ingredients, the mole ratio of aromatic component to aliphatic component is preferably in the range from 0.2:0.8 to 0.8:0.2. The actual mole% of aromatic dicarboxylic acids, aliphatic dicarboxylic acids, and

glycols in the final copolyester is not explicitly given by Chung, et al.

Although Chung, et al. do not explicitly set forth the mole% of the components of their copolyester resin, the mole% of individual components for some of the resins may be calculated from the Examples of Chung, et al. For instance, in Example 1 of Chung, et al., a copolyester is formed. Chung, et al. begin by forming an aromatic-aliphatic prepolymer, having a number average molecular weight of approximately 500, using 19.2 grams of dimethyl terephthalate (an aromatic dicarboxylic acid), 27 grams of 1,4-butanediol (a dihydric alcohol), and 11.8 grams succinic acid (an aliphatic dicarboxylic acid). 39.4 grams of the aromatic-aliphatic prepolymer is obtained. The copolyester is then formed by adding 118 grams of succinic acid, 135 grams of 1,4-butane diol, and a tetrabutyl titanate catalyst to the aromatic-aliphatic prepolymer under the appropriate reaction conditions. The resulting product has a number average molecular weight of 47,000 and a weight average molecular weight of 380,000 (see ¶34).

The mole% of aliphatic dicarboxylic acid, aromatic dicarboxylic acid, and dihydric alcohol in the final product may be calculated using the molar mass of dimethyl terephthalate, 1,4-butanediol, and succinic acid, and the total amount of each of these compounds used to create the copolyester. For instance, a total of 19.2 grams of dimethyl terephthalte was used to form the copolyester of Example 1. Since dimethyl terephthalate has a molar mass of about 194.2 grams/mole, the number of moles of dimethyl terephthalate used to form the

copolyester in Example 1 was about 0.0989 moles.[3] Similar calculations may be used to determine the number of moles of 1,4-butanediol (about 1.7980 moles)[4] and succinic acid (about 1.0991 moles)[5] used to form the copolyester.

The mole % of dimethyl terephthalate, 1,4-butanediol, and succinic acid in the copolyester resin may then be determined by dividing the amount of moles of each compound by the total number of moles in the copolyester (i.e., 2.996 moles).[6] Using this calculation, the copolyester of Example 1 of Chung, et al. has 3.3 mole% dimethyl terephthalate[7] (an aromatic dicarboxylic acid), 36.7 mole % succinic acid[8] (an aliphatic dicarboxylic acid), and 60.0 mole% 1,4-butanediol[9] (a dihydric alcohol), and a number average molecular weight of 47,000 and a weight average molecular weight of 380,000.

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[3] This equals the total amount of dimethyl terephthalate (i.e., 19.2 grams) times the molar mass of dimethyl terephthalate (i.e., 194.2 grams/mole).

[4] The total amount of 1,4-butanediol used to form the copolyester is 162 g (i.e., 27 grams used to form the prepolymer and an additional 135 g added thereto). The number of moles of 1,4-butanediol can be calculated by taking the total amount of 1,4-butanediol (i.e., 162 grams) times the molar mass of 1,4-butanediol (i.e., 90.1 grams/mole), which equals about 1.7980 moles of 1,4-butanediol.

[5] The total amount of succinic acid used to form the copolyester is 129.8 grams (i.e., 11.8 grams used to form the prepolymer and an additional 118 grams added thereto). The number of moles of succinic acid can be calculated by taking the total amount of succinic acid (i.e., 129.8 grams) times the molar mass of succinic acid (i.e., 118.1 grams/mole), which equals about 1.0991 moles succinic acid.

[6] This number is calculated by adding the number of moles of dimethyl terephthalate (i.e., 0.0989 moles), 1,4-butanediol (i.e., 1.7980 moles), and succinic acid (i.e., 1.0991 moles).

[7] 0.0989 moles dimethyl terephthalate / 2.996 total moles = 3.3 mole% dimethyl terephthalate.

[8] 1.0991 moles succinic acid / 2.996 total moles = 36.7 mole% succinic acid.

[9] 1.7980 moles 1,4-butanediol / 2.996 total moles = 60.0 mole% 1,4-butanediol.

As can be seen from these calculations, the copolyester made in Example 1 of Chung, et al. does not have a mole% of aliphatic dicarboxylic acids, aromatic dicarboxylic acids, and dihydric alcohols that fall within the ranges of mole% given for the AAPEs of Hale, et al. More particularly, none of the AAPEs of Hale, et al. have a mole% of dihydric alcohol in an AAPE comprising diols and diacids of more than 50 mole%. For instance, paragraphs 47-52 and the Examples of Hale, et al. describe several examples of AAPEs prepared from diols and diacids. However, none of these AAPEs have a mole% of diol greater than 50 mole%.[10]

As such, the copolyesters of Chung, et al. cannot be said to have an identical component breakdown by mol% as the films of Hale, et al. Consequently, it cannot be said that the copolyesters of Hale, et al. inherently have the same number average molecular weight and weight average molecular weight as the copolyesters of Chung, et al. as the copolyesters described

[10] It is noted that ¶47 of Hale, et al. state that the mole% given for diol components is based on 100 mole% of a diol component, and the mole % for diacid components is based on 100 mole% of a diacid component. The AAPEs thus have an equal amount of diol and diacid components. As such, the maximum mole% of total diol based on the combined diol and diacid components is 50 mole%.

Additionally, the only AAPE in Hale, et al. comprising an aromatic dicarboxylic acid having a mole% as low as 3.3 mole% is described in ¶49 of Hale, et al., and comprises about 30 to about 95 mole% succinic acid, about 5 to about 70 mole% terephthalic acid, about 90 to 100 mole % 1,4-butanediol, and 0 to about 10 mole% modifying diol, based on 100 mole percent of a diacid component and 100 mole percent of a diol component. However, while the mole% of terephthalic acid in this copolyester based on the combined diol and diacid components would be about 2.5 to about 35 mole%, the mole% of 1,4-butanediol based on the combined diol and diacid components would be about 45 to 50 mole%, which is less than the mole % of 1,4-butanediol in the copolyester produced in Example 1 of Chung, et al.

in these two references may have a different component breakdown by mole%.

Furthermore, even if the copolyesters of Chung, et al. and Hale, et al. did comprise the same breakdown of components by mole% (which as discussed above, they do not), the copolyesters would not necessarily have the same number average molecular weight and weight average molecular weight. More particularly, the number average molecular weight of a copolyester is not always correlated with a particular mole% breakdown of the components of the copolyester. For instance, the copolyester formed in Example 1 of Chung, et al. has a number average molecular weight of 47,000, which falls within the claimed range for number average molecular weight in applicants' claim 1 (i.e., about 35,000 to about 70,000 Daltons). However, the mole% breakdown for the components of the copolyester in Example 1 of Chung, et al. is 3.3 mole% dimethyl terephthalate (an aromatic dicarboxylic acid), 36.7 mole% succinic acid (an aliphatic dicarboxylic acid), and 60.0 mole% 1,4-butanediol (a dihydric alcohol). In contrast, the copolyester in applicants' claim 1 comprises from about 10 mole% to about 30 mole% of aromatic dicarboxylic acid, from about 20 mole% to about 40 mole% of aliphatic dicarboxylic acid, and from about 30 mole% to about 60 mole% dihydric alcohol. As can be seen from this comparison, while the copolyester from Example 1 of Chung, et al. has a number average molecular weight that falls within the claimed range of applicants' claim 1, the mole% of aromatic dicarboxylic acid (i.e., 3.3 mole%) does not fall within the

range of aromatic dicarboxylic acid set forth in applicants' claim 1 (i.e., from about 10 mole% to about 30 mole%).

As can be seen from this comparison, copolyesters having the same number average molecular weight will not always have the same mole% breakdown of components. The reverse of this is also true; i.e., copolyesters having the same mole% breakdown of components will not always have the same number average molecular weight. Consequently, the copolyesters of Hale, et al. cannot be said to inherently have the same number average molecular weight as set forth in applicants' claim 1.

In light of the foregoing discussion, applicants submit that one skilled in the art would not be motivated to modify or combine the Hale, et al. and Chung, et al. references to arrive at the absorbent article set forth in applicants' claim 1. In particular, neither Hale, et al. nor Chung, et al. disclose or suggest the desirability of a copolyester film comprising aromatic dicarboxylic acid, aliphatic dicarboxylic acid, and dihydric alcohol in applicants' claimed mole% that also has a weight average molecular weight of from about 90,000 to about 160,000 Daltons and a number average molecular weight of from about 35,000 to about 70,000 Daltons.

Furthermore, neither Hale, et al. nor Chung, et al. disclose copolyesters having a glass transition temperature of less than about 0°C, as required by applicants' claim 1. Recognizing this deficiency, the Office has cited Strand, et al. for combination with Hale, et al. and Chung, et al. More particularly, the Office has stated that Strand, et al. teach a film substantially identical to the film of Hale, et al. and

Chung, et al., and thus the glass transition temperature range taught by Strand, et al. would be inherent in the film of Hale, et al. Applicants respectfully disagree.

As noted above, the polyester compositions of Strand, et al. may comprise at least 80 mole% of diacid residues comprising one or more of terephthalic acid, naphthalenedicarboxylic acid, 1,4-cyclohexanedicarboxylic acid, or isophthalic acid,[11] and diol residues comprising about 10 to about 100 mole% 1,4-cyclohexanedimethanol and 0 to about 90 mole% of one or more diols containing 2 to about 20 carbon atoms, wherein the diacid residues are based on 100 mole% and the diol residues are based on 100 mole%.[12] The polyester may also further comprise from 0 to about 20 mole percent of one or more modifying diacids containing about 4 to about 40 carbon atoms. Thus, the polyester of Strand, et al. may either comprise at least about 80 mole % of an aromatic dicarboxylic acid (selected from terephthalic acid, naphthalenedicarboxylic acid, isophthalic acid, and groups thereof), based on 100 mole% diacid residues and 100 mole% diol residues, or else comprise 1,4-cyclohexanedicarboxylic acid.

Applicants note that Hale, et al. do not disclose a polyester comprising a diol and diacid component wherein the polyester comprises more than 35 mole% of an aromatic

[11] Applicants note that terephthalic acid, naphthalenedicarboxylic acid, and isophthalic acid are aromatic dicarboxylic acids, while 1,4-cyclohexanedicarboxylic acid is an alicyclic dicarboxylic acid.

[12] Strand, et al. further state that their polyesters contain substantially equal molar proportions of acid residues (100 mole%) and diol residues (100 mole%). *See* Strand, et al. at ¶23. Thus, the maximum mole% of diacid

dicarboxylic acid,[13] and alternatively, do not disclose a polyester comprising a diol and diacid component wherein the aliphatic carboxylic acid is 1,4-cyclohexanedicarboxylic acid. Consequently, the polyesters of Strand, et al. cannot be said to be substantially identical to the copolyesters of Hale, et al. As such, the copolyesters of Hale, et al. cannot be said to inherently have the same glass transition temperature range as the polyesters of Strand, et al.

Applicants further note that Strand, et al. does not disclose the number average molecular weight or weight average molecular weight for the polyesters described therein. Thus, like the combination of Hale, et al. and Chung, et al., discussed above, there is no motivation in the cited references to modify or combine Hale, et al., Chung, et al., and Strand, et al. to arrive at the absorbent article set forth in applicants' claim 1. In particular, neither Hale, et al., Chung, et al., nor Strand, et al. disclose or suggest the desirability of a copolyester film comprising aromatic dicarboxylic acid, aliphatic dicarboxylic acid, and dihydric alcohol in applicants' claimed mole% that also has a weight average molecular weight of from about 90,000 to about 160,000 Daltons and a number average

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residues (or diol residues) based on the combined diacid and diol components would be 50 mole%.

[13] As noted above, ¶47-52, 60, and the examples of Hale, et al. disclose copolyesters comprising diols, aliphatic dicarboxylic acids, and aromatic dicarboxylic acids. The largest mole% of aromatic dicarboxylic acid disclosed for these copolyesters is given in ¶48 and 49, which each disclose a copolyester that may comprise about 25 to about 70 mole% or about 5 to about 70 mole% terephthalic acid, respectively, based on 100 mole percent of a diacid component and 100 mole percent of a diol component. In other words, these copolyesters may comprise up to about 35 mole% terephthalic acid based on the combined diacid and diol components.

molecular weight of from about 35,000 to about 70,000 Daltons, and a glass transition temperature of less than about 0°C.

In light of the foregoing, applicants submit that claim 1 is patentable over the cited references. Claims 2-53 depend directly or indirectly from claim 1 and are thus patentable for the same reasons as set forth above for claim 1 as well as for the additional elements they require.

Claim 54 is directed to an absorbent article comprising a laminated outer cover, the laminated outer cover comprising a biodegradable stretched aliphatic-aromatic copolyester film. The film comprises filler particles and a copolyester comprising from about 10 mole% to about 30 mole% terephthalic acid, from about 20 mole% to about 40 mole% adipic acid, from about 30 mole% to about 60 mole% 1,4-butanediol, and wherein the copolyester has a weight average molecular weight of from about 90,000 to about 160,000 Daltons and a number average molecular weight of from about 35,000 to about 70,000 Daltons, and wherein the glass transition temperature of the copolyester is less that about 0°C.

Claim 54 is patentable for the same reasons as set forth above for claim 1. Claims 55-57 depend directly or indirectly from claim 54 and are thus patentable for the same reasons as set forth above for claim 54 as well as for the additional elements they require.

CONCLUSION

In light of the foregoing, applicants request reconsideration of the rejection of claims 1-57 and allowance of all pending claims. The Commissioner is hereby authorized to charge any fees which may be required during the entire pendency of this application to Account No. 19-1345.

Respectfully submitted,

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